REPORT OF THE OFFICE OF PROPERTY EQUALIZATION

City of Boston, Kevin H. White, Mayor

Report of The Office of Property Equalization

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INTRODUCTION

INTRODUCTION

The Office of Property Equalization (O.P.E.) is an independent office within the city government created for the purpose of providing equalized property tax assessments in accordance with the laws of the Commonwealth.

It is the conviction of the City administration that the equalization of property tax assessments is a necessity. The creation of O.P.E. serves the dual function of maintaining responsibility for the equalization process within the city government to guarantee public accountability and insuring that equalization will be the sole work responsibility of one office.

O.P.E. was officially created March, 1978.

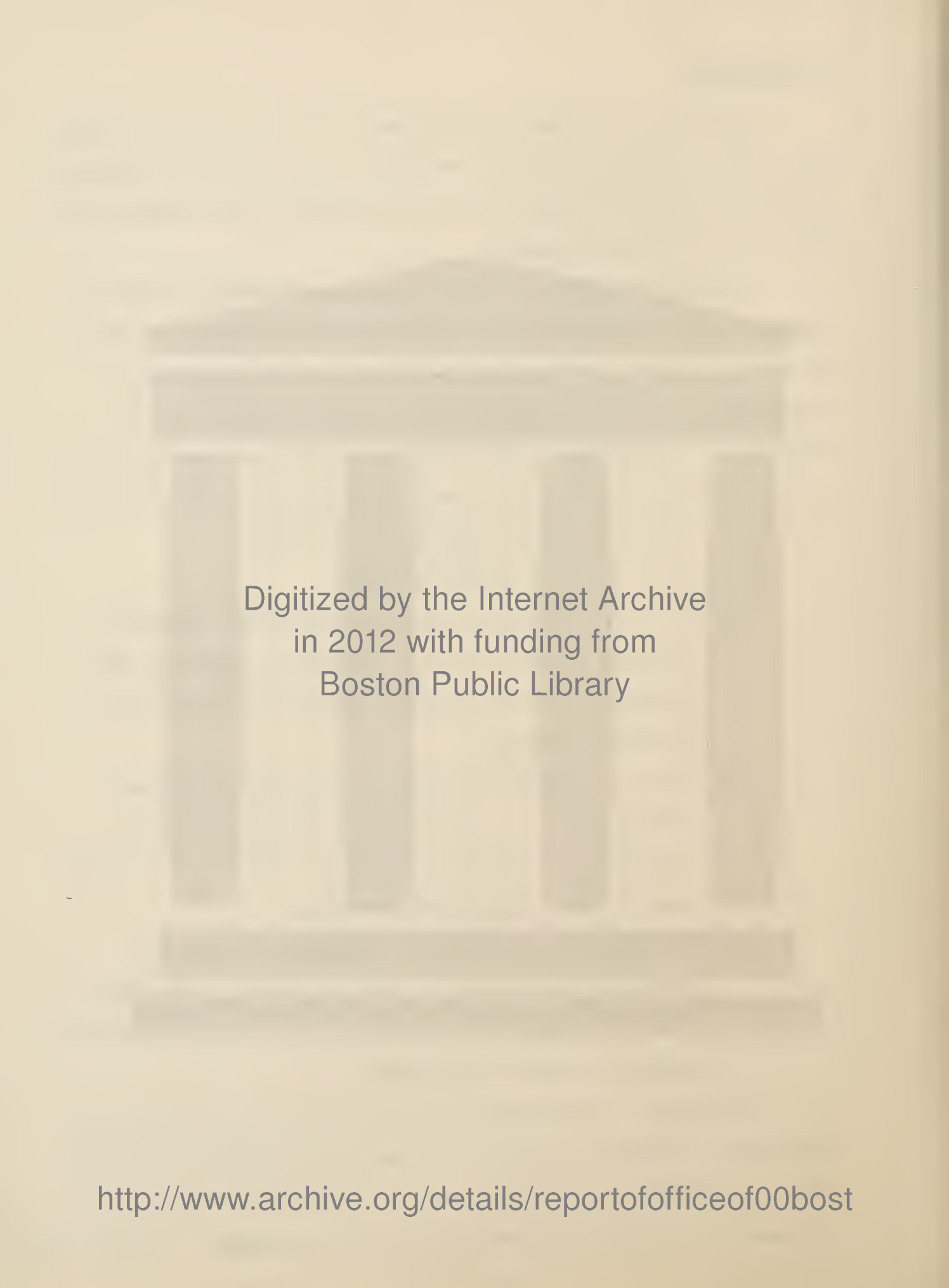
The initial findings of O.P.E. were:

(1) The City of Boston Assessing Department presently conducts a totally manual system of appraisal and utilizes the city computer merely for billing and ownership purposes.

(2) Under this manual system, with present budgetary constraints, it is impossible for the Assessing Department to annually appraise each one of its more than 106,000 real estate parcels.

(3) To increase the number of personnel within the Assessing Department so that an annual reassessment could be manually performed would be uneconomical and administratively burdensome.

Therefore, it was decided that the Assessing Department implement a computer assisted mass appraisal system which will have the capacity to annually update assessments and will end the need for periodic city-wide equaliztion programs. It was also



decided that O.P.E. begin a six month period of specific planning to provide a master plan for development and implementation of this system.

O.P.E. secured the services of Joseph E. Hunt and Company, Inc., consultant specialists, to provide a "Users Manual" for the equalization of real estate. O.P.E. not only worked directly with Hunt and Company to insure that this manual was specifically tailored to the needs of the City of Boston, but also maintained full responsibility for the development of recommendations in all areas of equalization that did not specifically relate to the valuation of real estate.

The three volumes are the final product of this planning and together, constitute the City of Boston Master Plan for Equalization.

The first volume, the Boston Equalization Program, provides historical, demographic and statistical data pertaining to the City. Also included in this volume are specific sections on tax mapping, the valuation of personal property, and O.P.E.'s work to date.

The second volume, a Users Manual for the Equalization of Assessments, contains the recommendations for implementing a computer assisted mass appraisal system. Specific topics included are: selection of valuation models, data base design, data collection and administration.

The third volume is a technical compendium which includes neighborhood data, mapping specifications and proposed equipment.

A summary of the major conclusions contained in

Boston's Master Plan for Equalization are as follows:

(1) That a study of the sufficiency of Boston's tax maps be undertaken immediately to determine the steps necessary to make the maps conform to a computer assisted mass appraisal system- including a re-numbering of parcels to reflect geographic location.

(2) That the present Personal Property unit within the Assessing Department be maintained but that valuations be implemented using a market based cost approach.

(3) That a market based cost approach be used as the principal valuation methodology for assessing improvements to real property.

(4) That the market based cost approach be supplemented with the valuation methods of income capitalization and multiple regression analysis wherever applicable.

(5) That a land valuation unit be formed to maintain all land values for the City of Boston in one central location.

(6) That a data collection program be undertaken to measure and list all applicable data elements necessary for valuation. This effort will involve the personal inspection of every parcel of real estate in the City of Boston.

(7) That computer programming be undertaken so that valuations can be produced immediately at the end of this data collection program.

(8) That the entire equalization process be performed by the Office of Property Equalization working in close cooperation with the Assessing Department of the City of Boston. Consultants should be used on a sporadic basis only where it would not be cost efficient to provide unique skills on a full time basis, e.g. (cartography etc.).

Based on the opinions contained in the report of Joseph E. Hunt and Company, Inc., and in-house study, it is the belief of the Office of Property Equalization that with full funding (estimated at $7.5 million) and optimum conditions, the minimum time necessary to complete the entire process of equalization in the City of Boston will be 36 months from the date of approval of the City's Master Plan by the Massachusetts Department of Revenue.

This three year period has been projected after careful study of every phase of the proposed system and from an analysis of the development of other systems in both Massachusetts and other jurisdictions.

While there are many problems that could arise to delay the equalization process (e.g.severe bad weather may delay field operations, etc.), it is the conclusion of O.P.E. that the 36 month schedule can be met.

The equalization process is itself a series of separate functions. Some of these functions (e.g. mapping) are totally independent and may be performed on individual time tables. Other functions (e.g. data collection, system testing, etc), are overlapping and require other work to be completed

before they can logically begin.

Each major function in the equalization process is delineated below with time completion estimates and starting (or phase-in) dates. All dates are given in months, with the assumption that the first month corresponds to the approval of Boston's Master Plan for Equalization by the Department of Revenue.

COMPUTER PROGRAMMING:

The delineation and entry onto the computer of each automated task in the valuation process. This involves not only the entry of each mathematical function in the valuation process but also the creation of table files to store the incoming data. There are no tasks in the equalization process that must precede computer programming.

Estimated Time: 21 months

Starting Date: 1st month

MAPPING:

The updating of tax maps to meet the standards of a computer assisted mass appraisal system together with the implementation of a compatible parcel numbering system. This process cannot begin until a professional analysis of the city's present tax maps (currently underway) is completed on or before 3/15/79.

Estimated Time: 24 months

Starting Date: 4th month

PERSONAL PROPERTY:

The identification of all taxable personalty; the grouping of all personalty into type; the selection of the applicable valuation methodology for each type and where

necessary, on-site inspection and valuation of all personalty. There are no preconditions to initiating this process.

Estimated Time: 30 months

Starting Date: 1st month

DATA COLLECTION:

The process of gathering all data base elements necessary for real estate valuation including the hiring and training of personnel. This process will also be interfaced with the on-site inspection of personal property to limit field operations. Before the process of in-field data collection can begin, it is necessary to achieve a proper inventory of property (stratified by number, area and type); to have completed a sufficient quantity of computer programming to allow for data entry and immediate testing of the data elements contained in the property record card; and to delineate personal property by type and geographic location so that the data collection processes may be integrated.

Estimated Time: 24 months

Starting Date: 10th month

SYSTEM TESTING (Phase I):

The testing of both data collection procedures and computer programming to insure optimum use of personnel and the adequacy of data collection forms. This process cannot begin until a sufficient quantity of computer programming has been completed and the necessary field data collectors have been hired.

Estimated Time: 12 months

Starting Date: 13th month

SYSTEM TESTING (Phase II)

The testing of the accuracy of values produced by the equalization process. This testing cannot begin until all computer programming has been completed and sufficient quantities of field data exist.

Estimated Time: 12 months

Starting Date: 33 months

UPDATING

The capture and storage of any changes to data base items occuring after a field inspection for Data Collection. This process will begin simultaneously with Data Collection and continue as a permanent duty of the Assessing Department.

THE CITY

Part I THE CITY

The development of an equalization system for any city is an extremely complex task. In Boston, this complexity is compounded by demographic changes which continue to occur, by the city's 300 year construction history, and the importance of the property tax to the city's financial base.

The following sections - Population, Development History and The Revenue Structure - provide some basic data about the City of Boston and its neighborhoods.

I. POPULATION

It is generally agreed that the City of Boston's population has been relatively stable since 1970. Both the 1975 State Census and 1977 Federal Census estimates place Boston's population in the range of 640,000. A loss of 5,000 people between 1970 and 1975 contrasts with a decline of 100,000 in the 1950s and 50,000 in the 1960s.[1]

This stabilization reflects the success of Boston's neighborhood revitalization efforts as well as important new population factors. These include an influx of young middle-class adults and their preference for city living, a decline in household size, the growth in the number of two worker families and the premium this places on residence location close to the job.

1. Alexander Ganz, Boston; State of the City Economy, BRA Research paper 10/77.

These trends have resulted in concentrated growth for the neighborhoods of Back Bay/Beacon Hill, Fenway/Kenmore, and Allston/Brighton. Modest gains in population have been reported in several older neighborhoods hit with severe loses during the 1950s and 1960s. These include East Boston, Charlestown, South Boston and South Dorchester. The inner city neighborhood of Roxbury showed continued - though reduced - loss of population while the strength of other neighborhoods is evident in the stabilization of Jamaica Plain and North Dorchester.

This is illustrated in the table below:

Table 1: Boston's Population by Neighborhood 1971, 1975[2]

	Ward	1971	1975	Change
1.	East Boston	37,404	38,273	+869
2.	Charlestown	14,987	16,836	+1849
3.	North End	21,035	24,478	+3443
4.	South End	23,602	28,379	+4777
5.	Back Bay/Beacon Hill	38,500	40,929	+2429
6-7.	South Boston	44,436	44,358	-78
8-12.	Roxbury	92,858	87,672	-5186
13-14.	Roxbury/N.Dorchester	65,574	65,002	-572
15-17.	Dorchester	79,872	80,493	+621
18.	Mattapan-Hyde Park	61,396	63,604	+2208
19.	Jamaica Plain	29,063	28,219	-844
20.	West Roxbury	45,165	45,635	+470
21.	Allston/Brighton	39,254	43,193	+3193
22.	Brighton	29,318	29,898	+580
	TOTAL	622,464	636,969	+14,505

2. Massachusetts State Census 1975

II. PHYSICAL DEVELOPMENT

A development process spanning three centuries has given present day Boston a unique mixture of architectural styles and building types. The earliest period of development from Boston's founding in 1630 to 1870 saw vast amounts of land filled by private companies and the completion of projects mastermined by such individuals as Charles Bullfinch and Mayor Josiah Quincy. This development, which today is the Central City Area, Back Bay/Beacon Hill, the South End, is characterrized by office and industrial buildings of virtually every architectural style as well as a predominance of multifamily residential structures of brick and granite.

The second major period of growth (1870 - 1910) was characterized by the expansion of Boston through annexation of neighboring residential communities. The details of these annexations and the growth of these communities is outlined in Table 2. For our purposes it is important to keep in mind that these communities led independent existences for two centuries or more. Some of them had been developed long before annexation. They had well crystalized residential patterns and styles of their own designed to meet local needs with little or no regard for neighboring municipalities. Others, which had been sparsely settled, saw major residential developments during this period.

Table 2: Neighborhood Areas; Year of Annexation and Major Development[3]

Area	Annexed	Major Development	Predominant Structures
Charlestown	1874	1830-1880	Row houses + tenenents
South Boston	1804	1870-1890	Wooden and brick rowhouses
Roxbury	1868	1840-1900	Brick row house + triple deckers
Dorchester	1870	1870-1910	Triple decker
West Roxbury	1874	1870-1930	Single + Two Family homes
Hyde Park	1912	1890-1910	Single + Two Family homes
Brighton	1874	1870-1915	Single + Two Family homes

A majority of Boston's land area was developed by 1910. Any significant development that occurred between 1910 and 1958 was limited to major streets where newly installed street car lines spurred a pattern of commercial development. As a result of this development a wide variety of services and products were made available to residents of many neighorhoods withing walking distance of their homes.

There were two other trends during this period that helped transform Boston into a modern City. First, an influx of European immigrants resulted in an increased demand for housing, particularly in emerging ethnically homogeneous neighborhoods. Faced with an increased demand homeowners often found it profitable to convert their large single family dwellings

3. Taken from BRA District Profiles and Proposed 1978-1980 Neighborhood Improvement Program.

into rooming houses or apartments. Today, many of these buildings are still being used for this purpose and pose special problems for assessors. Second, the exodus of middle-class residents to the suburbs after World War II caused declining property values and deteriorating housing conditions in some areas.

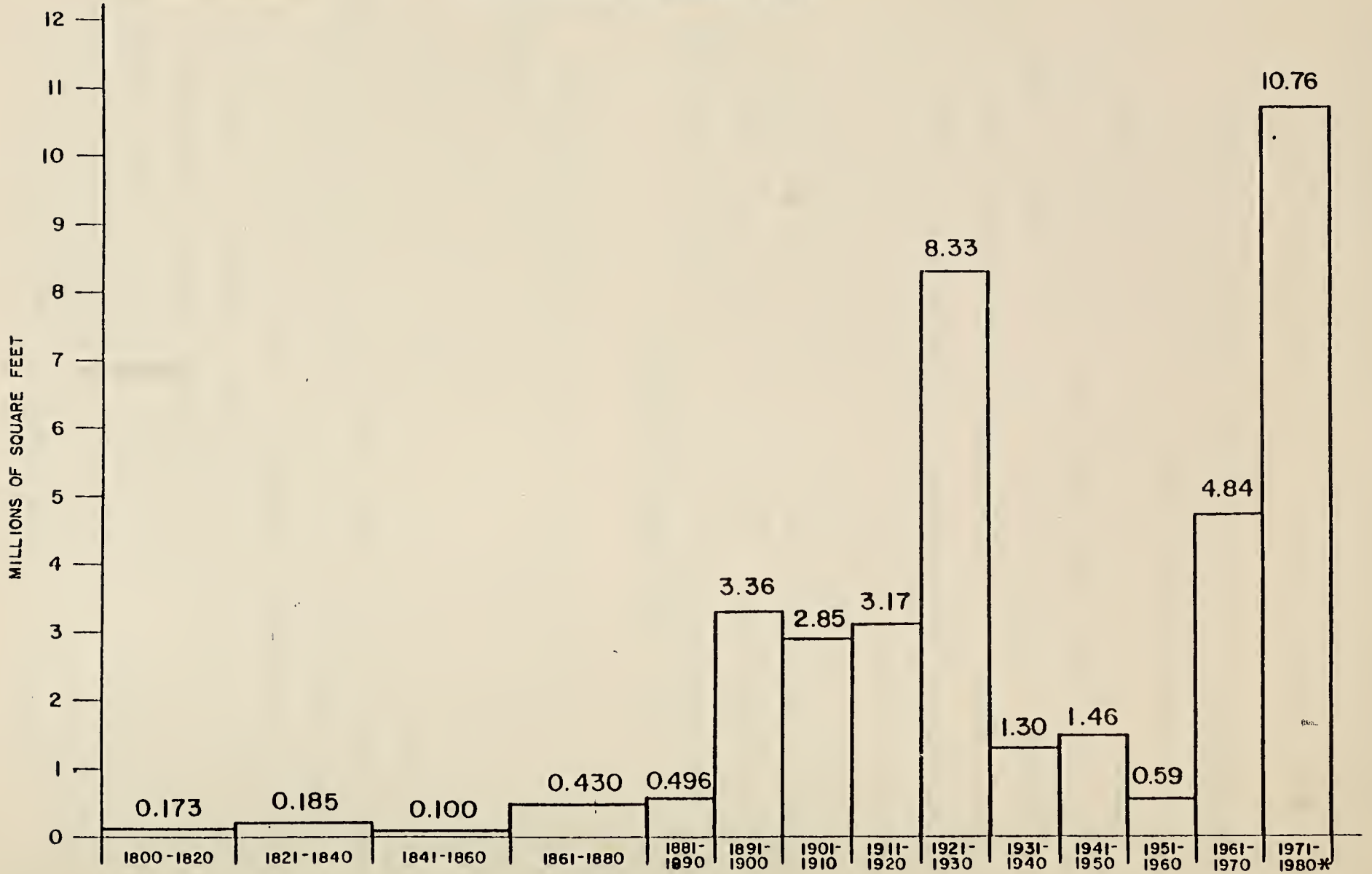
The latest period of growth, 1958 to the present, witnessed an unprecedented growth of office construction. During this period, Boston's total private office stock has nearly doubled from approximately 22½ million square feet in 1960 to nearly 38 million square feet today.[4]

Up until 1973 Boston's office market had been dominated by structures built between 1891 and 1930. Graph A illustrates that almost half of all existing office space downtown was built during these years.

4. Michael Matrullo, Boston's Office Market; A Brief look at Construction and Vacany Levels. BRA Research, August 1978

GRAPH A

DOWNTOWN BOSTON'S CURRENT OFFICE STOCK BY YEAR OF COMPLETION



MICHAEL MATRULLO, B.R.A. RESEARCH

SOURCE: OFFICE INDUSTRY SURVEY (OFFICE SPACE INVENTORY)

*ESTIMATED TO 1980

The influence of both materials used and architectural treatment in these periods explains the heterogenity observed in Boston today. The residential sections of Boston, especially those to the south and west, suggest a group of independent towns with individual histories and traditions. These sections generally maintain a tradition of wooden construction for ordinary dwellings. The two mile stretch of Blue Hill Avenue from Franklin Park to Mattapan Square is lined with such buildings. In contrast to this Commonwealth Avenue in Allston presents a frontage that is almost solidly brick. All of these areas stand in sharp contrast to the mixture of history and progress evident in both the central and inner neighborhood areas.

III. THE REVENUE STRUCTURE

The fiscal structure of the City of Boston is dominated by the property tax. Over the past twelve years, Boston has relied on the property tax to provide at least 60 percent of its revenue. In fact, Boston's reliance on this tax is currently greater than that of any major city in the country. In Los Angeles, San Francisco, and New York, for example, less than 30 percent of general revenues come from the property tax.[5]

Boston residents also pay higher percentages of their income in property taxes than those in other major cities. In Boston, a family of four earning $10,000, for example, will pay more than twice the amount of property tax than its counterparts in the thirty largest cities in the country.

5. Raising Revenue for Boston: A Program for Reform, City of Boston; Treasury Department, August 1975.

A substantial amount of property in Boston is tax-exempt. As the State Capital, as well as the academic and medical center for the region, Boston has naturally attracted a disproportionate share of tax-exempt institutions.

Clearly, given the importance of the property tax on Boston's revenue base, the equalization program must be carried out in a manner that recognizes this importance and that will guarantee fairness and reasonableness in equalizing values.

THE ASSESSING DEPARTMENT

PART II THE ASSESSING DEPARTMENT

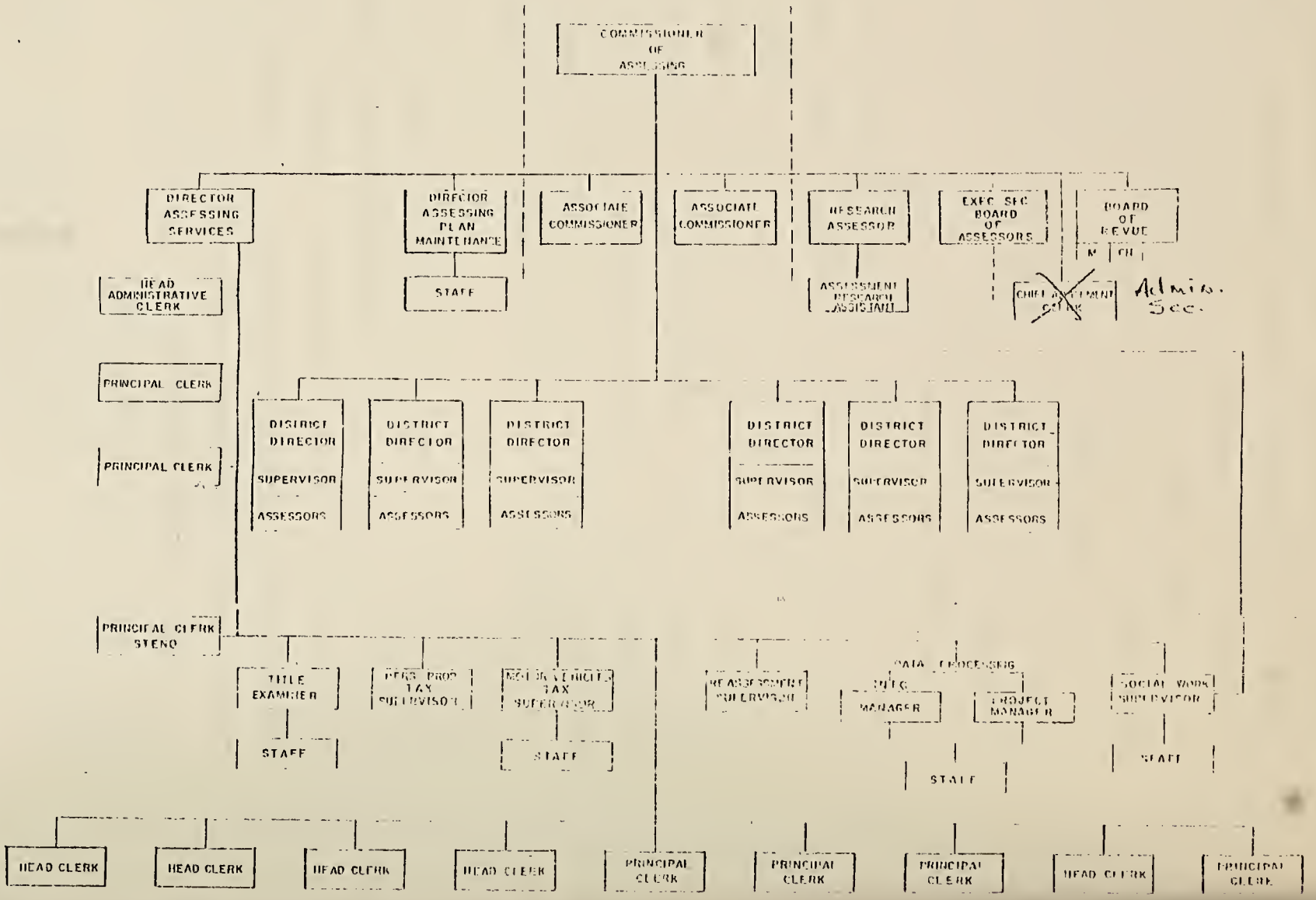
In Boston, the property tax is administered by the Assessing Department.

Under the direction of the Commissioner of Assessing, the department annually assesses all real and personal property in the City of Boston. The preparation of the tax bills and the collection of taxes are duties of the Collector-Treasurer. The Assessing Department also must submit certain annual reports to the Department of Revenue. These include the annual "Recapitulation of Tax Rate and Value", and reports of property sales.

The Commissioner of Assessing is aided by two Associate Commissioners. The Commissioner has two basic functions, - managing the Department and overseeing the valuation process. The Assessing Department also contains also contains a Board of Review to assist the Commissioner in the review of valuations through the abatement process. The Board of Review is comprised of three members, one from the Real Estate Division of the Assessing Department, one from the Statistical Research Divison, and the third from the public at large.

The organizational structure of the Assessing department is graphically represented in the following chart.

ORGANIZATIONAL STRUCTURE - ASSESSING DEPARTMENT



The Assessing Department employs eighty-five people, more than half of whom are charged with recording and maintaining information regarding title changes, consolidations and subdivisions of parcels, and correcting discrepancies in legal descriptions of property.

There are approximately 10,000 transfers of title, consolidations and subdivisions each year, and each of these changes must be manually recorded. The Assessing Department has very few automated operations. In addition to this recording activity, these same employees must respond to public inquiries, and render clerical support to the appraisal division.

In addition to the tasks of assessing the value of more than 100,000 parcels of real and personal property, the appraisal staff (assessors, supervisors and district directors) are also involved in the processing of abatement applications. Because of the number of such applications each year (approximately 14,000 in fiscal year 1977), the appraisal staff must devote considerable time and energy to these additional duties. Also, since a large number of these applications are appealed to the Appellate Tax Board (over 6,000 in fical year 1977), the appraisal staff must also devote large measures of time and energy to preparing cases and trial appearances. Needless to say, this large amount of litigation requires extensive record maintenance, thus further straining clerical support.

An additional duty of the Assessing Department is the processing of a quarter of a million excise tax bills and the review of approximately 100,000 applications for excise tax abatements. All of these applications must be thoroughly

reviewed before final action can be taken.

The processing of statutory abatements (e.g. for senior citizens, disabled veterans etc.) also constitutes a major effort of the Assessing Department. More than 15,000 of these statutory abatements were processed in fiscal year 1978.

As with the appraisal process, the excise tax and the statutory abatement functions of the Assessing Department are manual and have virtually no automated support.

The personnel within the Assessing Department are already burdened with a staggering workload. Therefore, it was decided that another office within the City Government make the process of implementing an equalization program its sole responsibility.

THE OFFICE OF PROPERTY EQUALIZATION

PART III THE OFFICE OF PROPERTY EQUALIZATION

Special Purpose Agency Approach

The Office of Property Equaliztion was created in March of 1978 with the sole responsiblity of designing and implementing an assessment system using the most advanced, practicable techniques available to produce equalized real estate and personal property assessments among all classes of property in the City of Boston as required by law.

Initial analysis and professional expertise indicated that the only method of developing this system with reasonable cost and timing considerations was the development of a Computer Assisted Mass Appraisal (CAMA) System.

There are several organizational methods that can be utilized to develop a CAMA system. These approaches, however, vary in their suitability for jurisdictions. They are listed as follows:

1. The Turnkey Approach

In which the jurisdiction contracts with a mass appraisal firm to perfom the revaluation. To maintain the new values, this approach requires one of two additional steps:

a. Contracting with the firm to provide subsequent updates.

b. Attempting to keep the new values current using the existing staff of the jurisdiction.

2. In-House Development-In which the agency responsible for the assessing function designs and implements a CAMA system itself, producing and maintaining equalized values.

3. Special Purpose Agency-In which the jurisdiction established an in-house agency to develop and implement a

CAMA system in conjunction with the ultimate user department.

4. Small Jurisdiction Approach - (This approach borders on the fringes of not being a CAMA system at all). In which small jurisdictions will perform most valuation work in-house, contracting with data processing bureaus to perform all automated functions.

The fourth alternative was rejected out of hand as being inappropriate for the City of Boston with its 105,000 parcels of real estate. After the management analysis indicated in part two above, the second alternative, In-House Development, was rejected due to the tremendous additional load that would be placed on the already overburdened City of Boston Assessing Department.

It became necessary to evaluate the remaining two options. For the purposes of the City of Boston, the major difference between the two, in practical terms, was whether or not the Office of Property Equalization would be the project management agency overseeing a Contracted Mass Appraisal Firm, or whether it would act as a Special Purpose Agency to actually develop and implement the necessary CAMA system for the City. To evaluate these options, extensive surveys were conducted on both a nationwide level and simultaneously on a Massachusetts-wide level. These surveys were directed to the officials responsible for administration of the property valuation function at state and local levels and Massachusetts assessors.

It was discovered through this survey that the use of a Contractual Mass Appraisal Firm (the Turnkey Approach), was not a viable option for Boston.

The experience of too many comparable or near comparable

jurisdictions indicated two major reasons for rejecting the Turnkey Option.

The first deals with the size and complexity of the jurisdictions to be valued. The typical appraisal firm will implement a system which has been developed by the firm on a generalized basis by tailoring it to the area to be valued.

For smaller or more homogenous jurisdictions this approach represents a highly accurate and cost effective approach. But as the size and heterogeniety of the jurisdiction increases, alterations necessary to produce accurate values become more extensive and sometimes interfere with the effective functions of the system. In addition, the local expertise and special knowledge concerning a jurisdiction, which are crucial in establishing an effective mass valuation system, are usually lacking.

As has been stated above, Boston, with its 105,000 parcels, is the largest taxing jurisdication in Massachusetts. It is also the most complex and heterogeneous. For this reason alone, the selection of the Turnkey Option could have been ruled out.

The second reason for rejection of the Turnkey Option deals with the capability of the jurisdiction to maintain values after they have been produced. Professional literature, and the results of the surveys indicate that there is a substantial problem posed by the inexperience of the inhouse personnel in maintaining the system, or values, once they have been turned over to the jurisdiction. The system,

therefore, degrades. Oftentimes a new revaluation must be undertaken only a few years after the first. Obviously this problem increases with the size and complexity of the jurisdiction. Smaller jurisdictions may be well able to maintain, even manually, the equalized values, but the lack of intimate, ground-up involvement by local personnel in the development of the CAMA system was seen to be a major problem. For this reason, the Turnkey Option was rejected.

There exists one final reason, which does not deal with the basic approach, but rather with the experience of a number of jurisdictions in which expert and established appraisal firms have, for various reasons, been unable to complete their contracts. Jurisdictions in Massachusetts have found themselves in a situation where substantial sums of public monies have been invested in a Turnkey Contract, only to find the firm unable to complete the project. This is not confined to Massachusetts. Other states have seen similar experiences. Because of the need for fiscal caution, and to assure that the job will be accomplished within the established time frame, the initial rejection of the Turnkey Option was confirmed.

It was thus determined that the Office of Property Equalization would act as the City of Boston's Special Purpose Agency which would oversee the development of the appropriate CAMA system necessary to equalize values in Boston.

OFFICE OF PROPERTY EQUALIZATION

WORK TO DATE

PART IV OFFICE OF PROPERTY EQUALIZATION

WORK TO DATE

The first major task of the Office of Property Equalization was the development of the Master Plan for Equalization. The Office contracted with Joseph E. Hunt and Company, Inc., for the development of a Users Manual for the Equalization of Boston Assessments which would form the major portion of the Master Plan.

With the submission of the report, this phase of the project is completed.

While working with Hunt and Company on the report, the Office was engaged in a number of other aspects of planning which support the Master Plan:

(1) Preparation of a Land Title Demonstration Project Application (for the City and the Suffolk County Registry of Deeds).

(2) A Review and Analysis of the City's mapping and parcel numbering capabilities.

(3) A survey of existing property-related recording functions within City Departments.

(4) Preparation of a plan for the valuation of personalty.

(5) An analysis of automated Cost Manuals.

The Executive Summary of the Land Title Demonstration Project, a description of the mapping project and the personalty report. follow. The survey and analysis of existing recording functions, and the analysis of automated Cost Manuals are both in progress.

1. APA/I BASED MODEL

AUTOMATED RECORDATION SYSTEM

SUBMITTED IN RESPONSE
TO
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
RFGA H-2894

July 14, 1978

EXECUTIVE SUMMARY

A. OVERVIEW

B. BENEFITS

C. MODEL SYSTEM

D. LEGAL CHANGES

E. WORK PLAN

This Application was submitted in July of 1978. A substantial effort was made to convince the Department of Hosuing and Urban Development that this grant application provided the best return on the dollar because of the synergistic effects of the simultaneous development of a CAMA System in the City of Boston. The total amount requested was $785,000.

A. OVERVIEW

The Suffolk County Registry of Deeds and the Office of Property Equalization of the City of Boston view the RFGA H-2894 as an exciting opportunity to work with HUD to develop a Land Title Recordation system that will be of immediate local benefit and adaptable to other jurisdictions in the United States. The model implementation will be of benefit to recording and registration offices and to all parties concerned with land title, The ultimate goal of the system is to reduce the costs associated with the conveyances of land in the United States.

In developing this proposal, the applicant has taken the view that the model system should serve the greatest number of potential users in an efficient and timely manner. While recognizing the need to automate the applicant is also aware that simplicity and ease of use are important design criteria.

The model herein proposed is inspired by Automated Land Title System described in the RFGA. However, it has several additional capabilities which give the model a resemblence to the Automated Multi-Purpose Data System. The model will store in a single data base relevant land title data that was previously maintained in separate systems. Automated and expanding the index capability of the recorded instruments will not only increase the accuracy and content of the title search process, but open the title search function to new users.

B. BENEFITS

The demonstration project proposed will result in benefits significant both to Suffolk County and to HUD on a national perspective. The primary benefit at the local level is the application of modern technology and management techniques to the Suffolk County Registry of Deeds. The recordation system now in place has not significantly changed since the days of the Stuart Monarchy. Yet, the benefits that will accrue from the use of the proposed system are of such a nature as to be transferable to other jurisdictions. The specific benefits that are expected to occur at the local level include:

(1) Rapid recording of all instruments relating to land.

(2) The establishment of a single land data bank which can automatically be accessed by all users.

(3) The capability of producing instant title searches that are accurate, certain, and complete instantaneously.

(4) Cost and time savings associated with increasing instrument recordation efficiency.

(5) A comprehensive parcel identification system that will be keyed to all other land data.

(6) A comprehensive, automated management report capability.

Upon completion of the Demonstration Project, the Suffolk County Registry will serve as a model recording office. As such it will offer to HUD and interested jurisdictions general system design information, detailed documentation and transferable software products.

C. MODEL SYSTEM

The model system proposed has the following functional capabilities:

1. Acceptance, verification, recordation and return of any land title instrument in a single working day.
2. Replacement of the manual Grantor/Grantee Index with a computerized Total Instrument Abstract which will provide a complete cross-index capability between previously uncorrelated property data.
3. Demystification of the land recordation process and increased citizen understanding of the process by providing citizens the capability to automatically and instantaneously retrieve abstracts/indexes of recorded instruments on a given parcel.
4. Provision of a rapid, accurate and certain title search capability, thereby simplifying conveyances of land.
5. Provision of a straight-forward interface capability between a land recording office and other relevant units of government, e.g. assessing, building, zoning, etc.
6. Generation of reports solely from the automated abstract/index file, e.g. manual sales analysis as required by state law.
7. Provision to a sole authority of a rapid assignment capability of new parcel numbers to subdivide or combine parcels.

8. Provision of a spatial analytical capability commencing at the parcel level through an automated digitizing capability.

The Model System will reside on the City of Boston's IBM 370/158 computer. The Model System will have full and free access to all the software products maintained on that computer, therefore,hardware procurement will be limited to necessary peripherals that will be placed at remote locations. The required peripheral equipment will include eight Cathode Tubes (CRT's) two Digitizers, one Graphics Display Tube, and three printers. The opportunity to use the City of Boston's central computing facility is viewed as the City's interest and commitment to this project.

D. LEGAL CHANGES

Massachusetts General Laws make provisions for the recordation of all documents relating to land transfers. Legal Modifications include amending current statutes so that registries have the opportunity to use advanced technologies to improve and enhance their operations. The major change in legislation would mandate that a systems interface be established between the courts and the Registry of Deeds, thus facilitating direct public notification of changes of title.

E. WORK PLAN

The work to be performed in this application will be divided into five phases, described below and represented in the following chart:

1. Research-two months

A thorough description of the current Land Title System divided into two major research tasks:

a. Description of the current environment

b. Sustantive system flow description.

2. Analysis Phase-one month

Examination of the existing system along the goals of the proposed APA/I and model Automated Land Title Recordation System. Analysis and Alternatives

a. System goals Description and Comaprison

b. Generation of Analysis and Alternatives

c. Preparation of Working Papers and Review.

3. Design Phase-three months

Actual Design of the System and Preparation of Design Report.

a. System Planning

b. System Design

c. Development Plan

d. Data Base Gross Design

4. Development Phase -18 months

Actual System Development, Implementation and Operation.

a. System Development and Implementation

b. System Test

c. System Operation and Maintenance

5. Demonstration Phase-3 months

Demonstration of System to HUD for Modification and

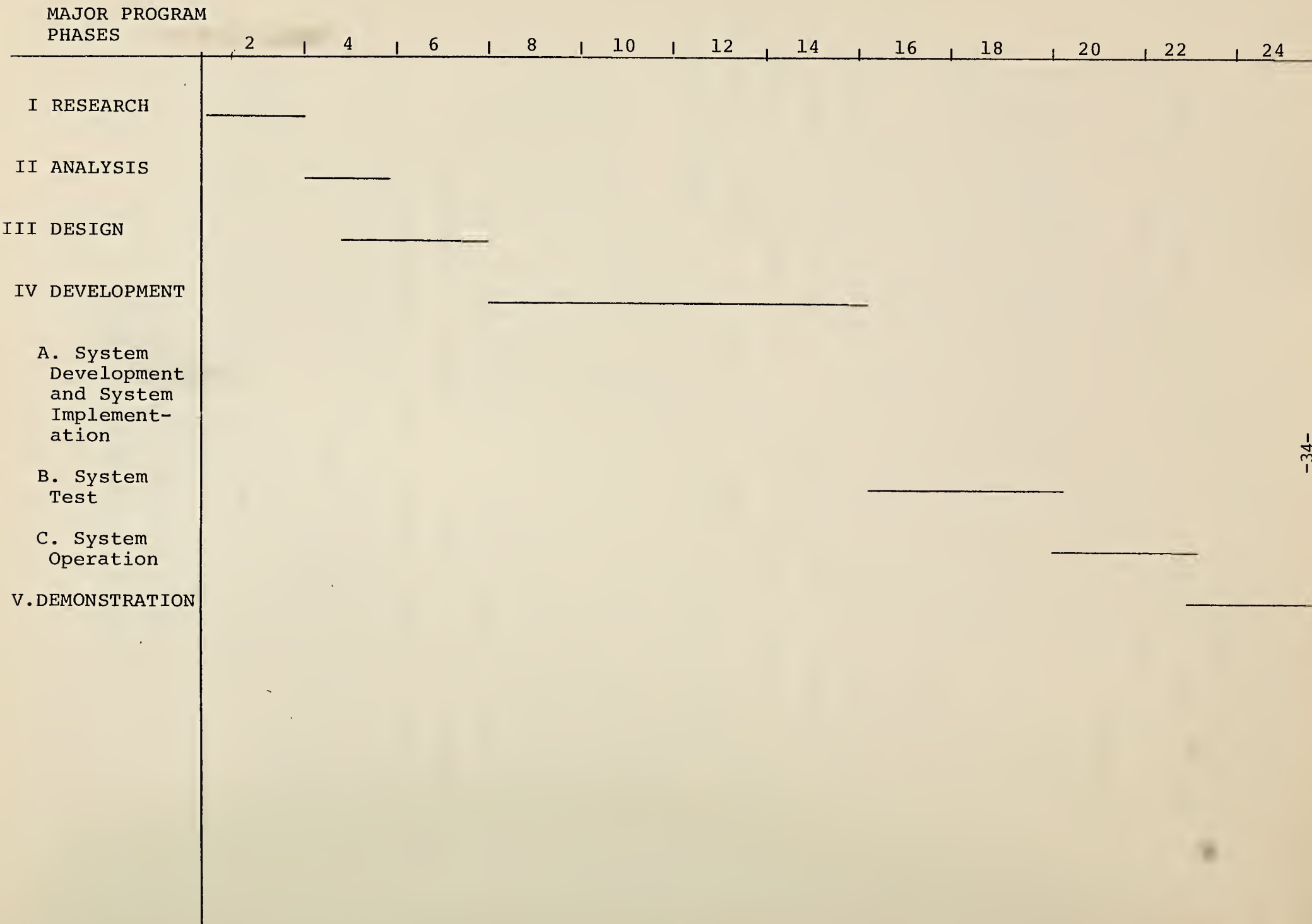
Sign-Off.

a. System Demonstration

b. Demonstration Evaluation

c. System Modification

The work described in the work plan will primarily be executed by a project staff although the System Data Base and software development will be performed by a consultant. The Suffolk County Register of Deeds grant recipient, will appoint the Director, Office of Property Equalization as the Supervisor of Project Administration for the project.


MAJOR PROGRAM PHASES
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I RESEARCH
II ANALYSIS
III DESIGN
IV DEVELOPMENT
A. System Development and System Implement-ation
B. System Test
C. System Operation
V. DEMONSTRATION

2. REVIEW AND ANALYSIS OF THE CITY'S MAPPING AND PARCEL NUMBERING CAPABILITIES

Before an assessor can determine the value of a property, the location, dimensions, and use of that property must be known. Assessing maps are the source of this essential information. They are recorded inventory of real property; and they provide a graphic representation of property for the assessor, the taxpayer, and any other interested parties. Often, assessing maps can be utilized for purposes unrelated to assessing functions by other municipal departments, and by organizations in the private sector. But clearly, accurate assessing maps are essential to the efficient functioning of an assessing department.

Assessing maps are more than mere graphic representations of spatially defined units of real property. Rather, assessing maps are complex and multi-purpose tools comprised of a number of separate but related components. These include a parcel identification system, which numerically represents parcels of property; a parcel locator system, which as its name indicates, specifies the site of a particular parcel of property; a series of section maps which graphically represent small units of a municipality; and an index and reference system which logically relates each of the components of the mapping system to each other.

In recognizing the need for an assessing map system that will function within a state of the art assessing environment upon the completion of equalization, the Office of Property Equalization has attempted to delineate the problems existing

in current engineering operations and to determine what options, if any, were available for eliminating these problems. Coincndent with this review, the capabilities and performance qualities of numerous firms which produce maps for assessing purposes were analyzed.

At this time it is advisable to review the present engineering operations of the City of Boston Assessing Department.

The current mapping system comes under the authority of the Director of Assessing Plan Maintenance. This department is staffed by two engineers with the responsibility to review and verify all property changes in the City of Boston. This department verifies correct ownership in property transfers, assigns new parcel numbers in property splits and new subdivisions and makes appropriate changes to existing planimetric maps. The process involves eight individual functions outlined as follows:

Step 1 By law, all sales and resubdivisions of property are recorded in the Suffolk County Registry of Deeds.

Step 2 Assessing Department staff in the Register's Office enter information from recorded documents on an abstract card. Such information includes the names of Grantor and Grantee,legal description of the property, square footage, kind of deed, consideration, date of recordation and the document number of the subdivision plan. Upon completion the abstract card is forwarded to the Engineering Division of the Assessing Department.

Step 3 At this point, the Engineering Division matches the legal description with existing planimetric maps. In the event of a resubdivision, the subdivision plan is ordered and verified. If there is a discrepancy between the subdivision plan and the maps, it will be resolved by the Engineering Division and the firm that certified the subdivision plan.

Step 4 After the property change has been verified by the Engineering Division, the assessors' maps are redrafted to reflect this change.

Step 5 New parcel numbers are assigned by the Engineering Division in a manner which maintains the original parcel number and adds new numbers for subdivided parts of the original parcel.

Step 6 Reproduceable copies of the planimetric maps are changed.

Step 7 When all map changes have been made, the Engineering Division completes a document called the "Appendix Sheet". The Appendix Sheet contains information which is used to complete a new field card to be used in measuring properties which have been sold and whose legal descriptions have changed.

Step 8 A copy of the Appendix Sheet is forwarded to a Ward Clerk. The Ward Clerk utilizes information in the Appendix Sheet to update assessing records.

Considering limitations inherent in the existing mapping system and the understaffed nature of this division, maintenance appears to be extremely well organized. This is due primarily to the fact that the department head has been with this department for a number of years and is totally familiar and adjusted

to the system. Problems still exist in the fact that deed descriptions do not always agree with the planimetric maps. It would be helpful if map numbers were a necessary requirement of the legal description. Discrepancies between deed calls and scaled areas should be noted on the maps.

Another problem area is the parcel numbering system. This numbering system, dating back to approximately 1930, does not allow properly for resubdivisions and parcel splits. Consequently, it is often necessary to renumber an entire block or add decimal suffixes to the point that the number become unwieldly and difficult for a unique parcel identification and for computer storage. Furthermore, the existing maps do not conform to the state plane coordinate number for identification and retrieval is also eliminated.

Our research revealed the highly specialized and esoteric nature of creating maps for assessing purposes, and that in order to make an informed decision regarding the quality and utility of the present assessing maps. persons with expertise in surveying, photogrammetry, and geodetic engineering, as well as the expected expertise in cartography would have to be retained to conduct an independent professional analysis of the present maps and engineering operations.

In seeking out persons with the expertise requisite for conducting this analysis, the Office of Property Equalization examined the resources and capabilities of local engineering colleges, including the Massachusetts Institute of Technology, Northeastern University, Tufts University, the University of

Massachusetts and the University of Lowell, Counsel was also sought from the Department of Community Affairs and the Massachusetts Association of Land Surveyers and Civil Engineers (MALSCE).

It was determined that two members of the Engineering Faculty of the University of Maine at Orono possessed the required qualifications to carry out this project.

The Office of Property Equalization has retained their services and on or before March 15, 1979, will receive an engineering report analyzing the adequacy of current assessing maps, the degree of their conformity to established engineering standards, and tax map-tax roll interface procedures. The report will also list recommendations for future improvements in engineering functions together with estimates of the costs and benefits if such improvements.

Upon receipt and approval of this engineering report, O.P.E. will carefully evaluate each option and recommendation contained therein, and upon completion of this evaluation, will commence implementation of those recommendations that are the most cost effective, are most suitable for modernizing the tax mappig operations of the City of Boston, and which will be most appropriate in allowing the Assessing Engineering Division to operate in the new milieu of a computerized mass appraisal system.

3. THE VALUATION OF PERSONALTY

Introduction

The mandate to establish equalized assessments applies to personal property as well as to real property. Any property not considered real estate is considered to be personalty.

However, it is often difficult to delineate what is taxable personal property because of the number of exemptions mandated by state law. The chart on the following pages is included to illustrate the varied rules applying merely to corporate personal property. This illustrates that the administration of personal property valuation is often more difficult than real estate valuation in administration.

The City of Boston Assessing Department presently has a Personal Property Unit which keeps detailed records of the inventory of taxable personal property in the City. The property is valued by members of the Appraisal Division. The actual valuation assignments are determined by the location of the property.

Form of Corporation	Taxable Personalty
Registered Massachusetts Business Corporations and Registered Foreign Business Corporations	All machinery used in the conduct of business-- EXCLUDING: 1. Stock in Trade; 2. Any property used directly for the refrigeration of goods or the air conditioning of the premises; and 3. Any property used directly in any purchasing, selling, or administrative function.
Registered Massachusetts Manufacturing Corporations and Registered Foreign Manufacturing Corporations	Poles, underground conduits, wires and pipes. All machinery used in the conduct of business of a manufacturing corporation is otherwise exempt. Note: This exemption does not apply to manufacturing corporations not legally registered.
Savings Banks, Co-operative Banks, and other corporations which are neither business nor manufactiring corporations	Poles, underground conduits, wires, pipes and any machinery used in the manufacture, supply, or distribution of water. All other personalty is exempt. However, this exemption does not apply to foreign insurance corporations unless the state in which they are either incorporated or have their principal place of business has a reciprocal exemption for Massachusetts corporations.
Corporations formed under Massachusetts General Laws Chapter 180	Totally exempt.

It is recommended that the separate personal property unit approach be maintained through the equalization process and be incorporated into the new valuation system. However, it also recommended that two members of the Appraisal Division be assigned permanently to this unit to insure standardization of the application of valuation methodologies.

Valuation Methods

No unique valuation approaches are required for the assessment of personal property. The methods of valuation of real property, the income approach, the market approach and the cost approach are also used to value personalty.

The income approach is generally considered to be the least reliable means of determining the value of tangible personal property and should be utilized with extreme caution. The income approach lends itself to items of personal property which are normally or usually leased or rented. This approach is also appropriate for consideration in the case of these properties where the income is regulated by the State and/or Federal Regulatory Agencies. In such cases, annual earnings may be capitalized to provide an indication of value. The capitalization of earnings generated by a business through the use of tangible personal property (e.g. equipment, machinery, etc.), is not recommended as an accurate approach in that earnings are based not only upon the intrinsic value of the personal property used, but also upon labor, skills, management techniques, etc. These are tangible factors, unrelated to the intrinsic value of the personal property.

If reliable, comparable data can be obtained and analyzed, the market or comparable sales approach is the most reliable

method of valuing personal property. If similar property is commonly bought and sold, the price which it brings in the open market is the best indication of value.

In order to utilize comparable sales approach, an assessor must first determine whether there exists an active market from which reliable data can be obtained. Having determined the existance of such a market, an assessor should value those items of personal property of like kind, quality and condition.

The most useful valuation approach is often the cost approach or the replacement-cost-less-depreciation method since it can be applied to virtually all personalty. In the absence of an established market for the item of personal property being considered, the process of valuation must include all factors that make up its intrinsic value. Historical cost is first adjusted to allow for physical depreciation and economic and functional obsolescence. The resulting valuation should provide a reasonable estimate of the cost which the taxpayer would incur were he to replace an item of personal property with another item of like kind, quality, condition and utility. In most instances an assessor should rely on the cost approach. However, available sales information should also be utilized in conjunction with this approach. It should be stressed that every valuation must be the product of the assessor's best judgement in light of all the available information.

In order to equalize personalty assessments, personal property must be identified and inventoried. This will occur during the Data Collection Phase of the Boston Equalization Project.

The personalty currently taxed in Boston may be divided into three broad catagories; office equipment, airline property, and unique personalty such as conduits, cables, storage tanks, etc.

The valuation of some unique personalty (e.g.underground cables) is highly complex and difficult. Consequently, appraisers skilled in the valuation of such property may have to be retained on a consultant basis.

All other personalty should be valued by the Personal Property Unit with the predominant use of a Market oriented cost approach.

This will involve the determination of replacement cost new less depreciation, modified by a market adjustment factor calculated through an analysis of sales of comparable property.

REPORT OF THE OFFICE OF PROPERTY EQUALIZATION

City of Boston, Kevin H. White, Mayor